Month XX, 2019

**"Draft/Proposed" Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3**
**"Draft/Proposed" Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4**
Delaware City Power Plant – Boilers 3 & 4 Steam Injection and Induced Flue Gas Recirculation Projects
Delaware City Refinery

Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE 19706

ATTENTION: Jeffery Coleman
Refinery Manager

Dear Mr. Coleman:

Pursuant to 7 **DE Admin. Code** 1102, Section 2.1.3, approval of the Department of Natural Resources and Environmental Control is hereby granted for the operation of Boilers 3 and 4 Steam Injection Project and Induced Flue Gas Recirculation (IFGR) Project on Riley Stoker Boiler 3 with a design heat input of 618 mmBtu/hour and Foster Wheeler Boiler 4 with a design heat input of 737 mmBtu/hour, located at the Delaware City Power Plant in the Delaware City Refinery in accordance with the following documents:

- Application submitted on Forms AQM-1, AQM-2, AQM-3.1 and AQM-5 dated April 12, 2013 and signed by Herman Seedorf;
- Application submitted on Forms AQM-1, AQM-2, AQM-3.1 and AQM-5 dated October 16, 2014 and signed by Jose Dominguez.
- Settlement Agreement dated July 11, 2019.

This permit is issued subject to the following conditions:

1. **General Provisions**

1.1. This permit expires 5 years from the date of issuance.

1.2. Representatives of the Department may, at any reasonable time, inspect this facility.

1.3. This permit may not be transferred to another person, owner, or operator unless the transfer has been approved in advance by the Department. Approval (or disapproval) of the permit transfer will be provided by the Department in writing. A request for a permit

transfer shall be received by the Department at least 30 days before the date of the requested permit transfer. This request shall include:

1.3.1 Signed letters from each person stating the permit transfer is agreeable to each person; and

1.3.2 An Applicant Background Information Questionnaire pursuant to 7 Del C. Chapter 79 if the person receiving the permit has not been issued any permits by the Department in the previous 5 years.

1.4 The owner or operator shall not initiate construction, install, or alter any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to submitting an application to the Department pursuant to 7 DE Admin. Code 1102, and, when applicable 1125, and receiving approval of such application from the Department; except as authorized by this permit or exempted in the Regulations.

1.5 The owner or operator shall submit a complete supplement to the Title V permit application pursuant to 7 DE Admin. Code 1130, Section 5(b) within 12 months of the date of issuance of this permit. The application shall address all applicable requirements including those of 40 CFR Part 64 (Compliance Assurance Monitoring) if applicable.

## 2. Emission Limitations

2.1 For the purpose of this condition, "TPY" is defined as "tons emitted in any rolling twelve month period". Air contaminant emission levels from the operation of Boilers 2, 3, 4, and the CCUs, shall not exceed the following and those specified by 7 **DE Admin. Code** 1100**:**

2.1.1 $NO_x$:

2.1.1.1 NOx emissions shall not exceed those prescribed in Condition 3, Table 1a.5.i. of **Permit: AQM-003/00016 – Part 3 (Renewal 2)(Revision 3)** dated April 12, 2018.

2.1.1.2 $NO_x$ emissions shall not exceed those achieved by proper operation of the boilers and associated Steam Injection and IFGR systems and 0.13 lb/mmBtu from each of Boilers 3 & 4 on a 24-hour rolling average.

2.1.1.3 The lb/mmBtu emissions standards for Boilers 3 & 4 in Condition 2.1.1.2 shall not apply during periods not to exceed 6 hours during each planned startup and shutdown. Instead, the boilers shall not exceed 0.2 lbs/mmbtu on a 24 hour average basis.

2.1.1.4 Condition 2.1.1.2 shall not apply during periods when the Steam Injection and/or IFGR is unavailable due to maintenance, malfunction, steam emergency or other abnormal steam demand scenarios for a period not to exceed 7 days as defined in Condition 3.3.

2.1.2 Sulfur Dioxide ($SO_2$) Emissions:
$SO_2$ emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 306.4 TPY. $SO_2$ emissions shall not exceed the following unit specific limits: 71.2 TPY for Boiler 2, 61.4 TPY for Boiler 3.

2.1.3 Carbon Monoxide (CO) Emissions:
CO emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 470.2 TPY. CO emissions shall not exceed the following unit specific limits: 106.6 TPY for

Boiler 2, and 92.0 TPY for Boiler 3. CO emissions shall not exceed 0.034 lb/mmBtu for Boiler 2 and 3 on a 24-hour rolling average basis

2.1.4 Particulate Matter ($PM_{10}$) Emissions:

2.1.4.1 $PM_{10}$ emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 311.0 TPY (inclusive of 235.4 TPY $H_2SO_4$ mist from Boilers 2 & 3 and the CCUs). $PM_{10}$ emissions shall not exceed the following unit specific limits: 27.8 TPY for Boiler 2, and 92 TPY for Boiler 3.

2.1.4.2 $PM_{10}$ emissions including $H_2SO_4$ shall not exceed the following limits:

2.1.4.2.1 0.0104 lb/mmBtu when firing natural gas or refinery fuel gas in Boilers 2, and 3.

2.1.5 Total Suspended Particles (TSP) Emissions:

2.1.5.1 TSP emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 78.7 TPY. TSP emissions shall not exceed the following unit specific limits: 15.7 TPY for Boiler 2, and 13.5 TPY for Boiler 3.

2.1.5.2 TSP emissions shall not exceed the following limits:

2.1.5.2.1 0.0062 lb/mmBtu when firing natural gas or refinery fuel gas in Boilers 2 and 3.

2.1.5.2.2 [RESERVED]

2.1.6 Volatile Organic Compounds (VOC) Emissions:

2.1.6.1 VOC emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 22.7 TPY. VOC emissions shall not exceed the following unit specific limits: 4.4 TPY for Boiler 2, and 3.8 TPY for Boiler 3.

2.1.6.2 VOC emissions shall not exceed the following limits:

2.1.6.2.1 0.0014 lb/mmBtu when firing natural gas or refinery fuel gas in Boilers 2, and 3.

2.1.7 Sulfuric Acid ($H_2SO_4$) Emissions:
Emissions from the CCUs and Boiler 2, and 3combined shall not exceed 235.4 TPY. $H_2SO_4$ emissions shall not exceed the following unit specific limits: 10.9 TPY for Boiler 2, 71.6 TPY for Boiler 3.

2.1.8 Lead (Pb) Emissions:
Pb emissions from the CCUs and Boiler 3 combined shall not exceed 0.02 tons on a rolling twelve month basis.

2.2 None of the boilers shall emit visible air contaminants exceeding 20% opacity for an aggregate of more than 3 minutes in any 1 hour period, or more than 15 minutes in any 24 hour period.

2.3 Odors from this source shall not be detectable beyond the plant property line in sufficient quantities such as to cause a condition of air pollution.

## 3. Operational Limitations:

3.1 Only desulfurized refinery fuel gas (RFG) with a hydrogen sulfide content less than 0.1 grain/dscf on a 3 hour rolling average and/or natural gas may be fired in Boilers 2, 3, and 4.

3.2 Except during periods of startup and shutdown, the burner steam injection systems and IFGR systems in Boilers 3 and 4 shall be working in a manner consistent with maintaining 0.13 lb/MMBtu NOX on a 24 hour rolling average.

3.3 Except as provided by Condition 3.3.2, Boilers 3 and/or 4 shall not be operated unless the respective Steam Injection and IFGR systems are in use and operating properly whenever the systems are available. Compliance with the emission limitation in 2.1.1 shall constitute proper operation. The Owner/operator shall operate the IFGR system for each boiler in accordance with manufacturer's recommendations.

3.3.1 The IFGR and/or Steam Injection systems are considered available except during periods of planned maintenance or malfunction as defined below or during periods of steam emergency or other abnormal steam demand scenarios.

3.3.2 "Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner, and that causes the source to exceed a technology based emission limitation under the permit, due to unavoidable increases in emissions attributable to the malfunction. An emergency or malfunction shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

3.3.3 Steam emergency/abnormal steam demand means an upset of the refinery steam header system resulting in the need for operating steam generating sources to significantly or rapidly adjust their loads to attempt to maintain or restore stable operations. Such periods shall not exceed 7 days in duration.

3.4 At all times, including periods of startup, shutdown, and malfunction, the owner or operator shall maintain and operate the equipment and processes covered by this Permit, including all structural and mechanical components of all equipment and processes and all associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

## 4. Compliance Methodology, Testing and Monitoring Requirements

4.1 Compliance with Condition 2.1.1 for Boilers 2, 3, 4 and the CCUs shall be demonstrated using a Continuous Emissions Monitoring Systems (CEMS) for $NO_x$ and $O_2$. The CEMS for Boilers 2, 3 and the CCUs shall conform to the applicable Performance Specifications in 40 CFR, Part 60, Appendix "B" and the Quality Assurance/Quality Control (QA/QC) procedures for $NO_x$ CEMS in accordance with 40 CFR Part 60, Appendix "F". The CEMS for Boiler 4 shall conform to the applicable Performance Specifications in 40 CFR, Part 75, Appendix "A" and the Quality Assurance/Quality Control (QA/QC) procedures for $NO_x$ CEMS in accordance with 40 CFR Part 75, Appendix "B".

4.2 Compliance with Condition 2.1.2 shall be demonstrated using the Refinery Fuel Gas $H_2S$ Continuous Monitoring System (CMS) for emissions from Boilers 2 and 3. The CEMS shall

conform to Performance Specification 2 in 40 CFR, Part 60, Appendix "B" and the Quality Assurance/Quality Control (QA/QC) procedures in accordance with 40 CFR Part 60, Appendix "F".

4.3 Compliance with Condition 2.1.3 shall be demonstrated by using CEMS on Boiler 2 and by a stack test based emissions factor and fuel flow rate for Boiler 3. The QA/QC procedures for the CO CEMS shall be established in accordance with the procedures in Appendix "F" of 40 CFR 60.

4.4 Compliance with Conditions 2.1.4, 2.1.5 and 2.1.6 shall be demonstrated by firing only natural gas or by using annual stack test based emissions factors while firing RFG and RFG fuel flow rates for the boilers.

4.5 Compliance with Condition 2.1.7 for Boilers 2 and 3 shall be demonstrated by applying the fuel gas monitored $H_2S$ content to the $H_2SO_4$ conversion factor.

4.6 Compliance with Condition 2.1.8 shall be based on firing only natural gas or, desulfurized fuel gas.

4.7 Compliance with Conditions 2.2 for Boilers 2, 3 and 4 shall be based on COMS. The COMS shall conform to Performance Specification 1 in 40 CFR, Part 60, Appendix "B".

4.9 The Company shall conduct the following stack tests for Boiler 3 annually:

4.9.1 EPA Reference Method 5 for TSP
4.9.2 EPA Reference Method 5B/202 for $PM_{10,}$ including $H_2SO_4$
4.9.3 EPA Reference Method 10 for CO except for Boiler 2
4.9.4 EPA Reference Method 25 A for VOC
4.9.5 EPA Reference Method 8 for $H_2SO_4$
4.9.6 Within 90 days after achieving the maximum production rate at which the facility will be operated, but not later than 180 days after initial startup of such facility, the owner or operator shall conduct performance test(s) and furnish the Department with a written report of the results of such performance test(s) in accordance with the following general provisions:

4.9.6.1 One original and 2 copies of the test protocol shall be submitted a minimum of 30 days in advance of the tentative test date to the address in Condition 6.3. The tests shall be conducted in accordance with the State of Delaware and Federal requirements.

4.9.6.2 The test protocol shall be approved by the Department prior to initiating any testing. Upon approval of the test protocol, the Company shall schedule the compliance demonstration with the Air Surveillance and Engineering & Compliance Branches. The Department must observe the test for the results to be considered for acceptance, unless the Department determines in advance, in writing, that the test need not be observed. Further, the Department may in its discretion determine based on its observation of the test that it need not observe the entire test.

4.9.6.3 The final results of the testing shall be submitted to the Department within 90 days of the test completion. One original and 2 copies of the test report shall be submitted to the addresses below:

| Original and One Copy to: | One Copy to: |
|---|---|
| Engineering & Compliance Group | Air Surveillance Group |
| Attn: Assigned Engineer | Attn: Program Manager |
| State Street Commons | 715 Grantham Lane |
| 100 W. Water Street, Suite 6A | New Castle, DE 19720 |
| Dover, DE 19904 | |

4.9.6.4 To be considered valid, the final results report shall include the emissions test report (including raw data from the test) as well as a summary of the results and a statement of compliance or non-compliance with permit conditions signed by a member of the Company's Health, Safety and Environment department.

4.9.6.5 The results must demonstrate to the Department's satisfaction that the emission unit is operating in compliance with the applicable regulations and conditions of this permit; if the final report of the test results shows non-compliance the owner or operator shall propose corrective action(s). Failure to demonstrate compliance through the test may result in enforcement action.

4.9.6.6 The Company may petition the Department for less frequent testing if future data shows that testing on an annual basis is unwarranted.

4.10 Compliance with Condition 3.1 shall be based on an instrument installed for continuously monitoring and recording the concentration (dry basis) of $H_2S$ in RFG before it is combusted in any fuel burning device. The instrument shall be located downstream of all process steps which impact the composition of RFG prior to its being combusted in any fuel burning device. This instrument shall conform to the QA/QC requirements of Appendix "F" in 40 CFR 60. The $H_2S$ monitor shall conform to Performance Specification 7 of 40 CFR 60, Appendix "B". Method 11 of 40 CFR 60, Appendix "A" shall be used for conducting the relative accuracy evaluations.

4.11 Compliance with Condition 3.2 shall be based on the record keeping requirements.

4.12 Department representatives shall be given the opportunity to witness all stack emission testing and monitor certification testing including any test audits conducted on the monitors as part of the Quality Assurance Program.

4.13 Compliance with Conditions 2.3 and 3.3 shall be based on information available to the Department, which may include, but is not limited to, monitoring results, opacity and process operating data.

## 5. Record Keeping Requirements

5.1 The Company shall maintain all records necessary for determining compliance with this permit in a readily accessible location for 5 years and shall make these records available to the Department upon written or verbal request.

5.2 The following records shall be maintained for a period of 5 years:

- 5.2.1 Log of all operating hours of each boiler clearly showing the hours of operation with different fuel types, i.e., hours of operation with natural gas, refinery fuel gas, and the amount of each fuel type consumed;
- 5.2.2 Rolling 24-hour heating values of the fuels combusted;
- 5.2.3 Opacity readings recorded by the COMS;
- 5.2.5 Log of daily qualitative stack observations for the package boilers
- 5.2.6 CEMS data including calibration log and results of all Cylinder Gas Audits and all Relative Accuracy Test Audits.

## 6. Reporting Requirements

6.1 Emissions in excess of any permit condition or emissions which create a condition of air pollution shall be reported to the Department immediately upon discovery and after activating the appropriate site emergency plan, in the following manner:

- 6.1.1 By calling the Department's Environmental Emergency Notification and Complaint number (800) 662-8802, if the emission poses an imminent and substantial danger to public health, safety or the environment.
- 6.1.2 Other emissions in excess of any permit condition or emissions which create a condition of air pollution may be called in to the Environmental Emergency Notification and Complaint number (800) 662-8802 or faxed to (302) 739-2466. The ability to fax in notifications may be revoked upon written notice to the Company by the Department in its sole discretion.
- 6.1.3 In addition to complying with Conditions 6.1.1 and 6.1.2 of this permit, the Owner/Operator shall satisfy any reporting required by the "Reporting of a Discharge of a Pollutant or an Air Contaminant" regulation, within 30 calendar days of becoming aware of an occurrence subject to reporting pursuant to these conditions. All reports submitted to the Department shall be submitted in writing and shall include the following information:
  - 6.1.3.1 The name and location of the facility;
  - 6.1.3.2 The subject sources that caused the emissions;
  - 6.1.3.3 The time and date of the first observation of the excess emissions;
  - 6.1.3.4 The cause and expected duration of the excess emissions;
  - 6.1.3.5 For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission or operational limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
  - 6.1.3.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

- 6.1.4 Emissions on the same day from the same emission unit may be combined into one report. Emissions from the same cause that occur contemporaneously may also be combined into one report. The

Owner/Operator shall submit an electronic copy of all required reports to the Department's compliance engineer assigned to the Refinery.

6.2 The Company shall comply with the following semi-annual excess emissions reports. The reports for the preceding semi-annual period shall be submitted to the Department by January 31 and July 31 of each calendar year with a summary of all excess emissions for the semi-annual period. The summary shall include:

6.2.1 The name and location of the facility;
6.2.2 The subject sources that caused the excess emissions;
6.2.3 The time and date of the first observation of the excess emissions;
6.2.4 The cause and expected duration of the excess emissions;
6.2.5 The estimated amount of emissions (expressed in the units of applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
6.2.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.
6.2.7 All periods of opacity exceedances.

6.3 Send one (1) original to:

The Program Administrator
Division of Air Quality
State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904

and one (1) copy of all required reports to:

Program Manager
Engineering and Compliance Group
715 Grantham Lane
New Castle, DE 19720

## 7. Administrative Conditions

7.1 This permit shall be available on the premises.

7.2 This permit authorizes the operation of the equipment authorized to be constructed by **Permit: APC-90/0290-CONSTRUCTION (Amendment 10) – Boiler 3** and **Permit: APC-90/0291-CONSTRUCTION (Amendment 3) – Boiler 4** dated July 15, 2103 and supersedes **Permit: APC-90/0290-OPERATION (Amendment 10) – Boiler 3,** & **Permit: APC-90/0291-OPERATION (Amendment 3) – Boiler 4** dated May 19, 2014, and **Permit: APC-90/0290-CONSTRUCTION/OPERATION (Amendment 12) – Boiler 3,** & **Permit: APC-90/0291-CONSTRUCTION/OPERATION (Amendment 5) – Boiler 4** dated January 15, 2015.

7.3 Failure to comply with the provisions of this permit constitutes good cause for suspension or revocation of this permit.

Sincerely,

Angela D. Marconi, P.E., BCEE
Program Manager
Engineering & Compliance Branch

ADM:LTR
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pc: Dover Title V File
Dawn Minor
Lindsay Rennie